1. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 35x^2 + 33x + 10}{3x^2 + 11x + 6}$$

A. Horizontal Asymptote of $y = -3.0$ and Oblique Asymptote of $y = 4x - 3$

B. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x - 3$

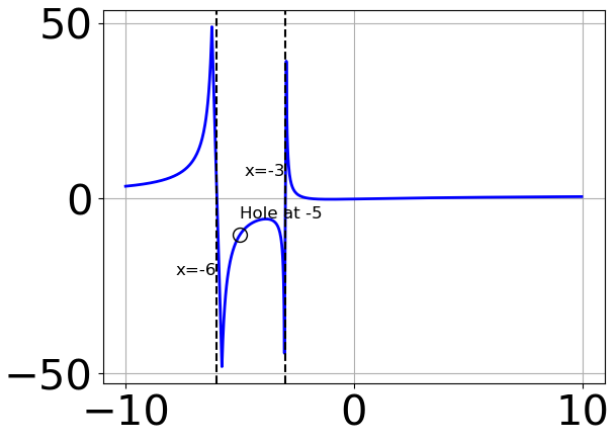
C. Horizontal Asymptote of $y = 4.0$

D. Horizontal Asymptote at $y = -3.0$

E. Oblique Asymptote of $y = 4x - 3$.

---

2. Which of the following functions *could* be the graph below?




A. $f(x) = \dfrac{x^3 + x^2 - 4.0x - 4.0}{x^3 - 14.0x^2 + 63.0x - 90.0}$

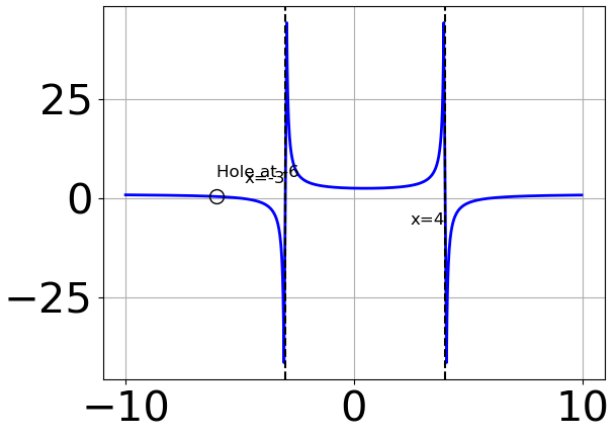
B. $f(x) = \dfrac{x^3 + 5.0x^2 - 4.0x - 20.0}{x^3 + 14.0x^2 + 63.0x + 90.0}$

C. $f(x) = \dfrac{x^3 - 5.0x^2 - 4.0x + 20.0}{x^3 - 14.0x^2 + 63.0x - 90.0}$

D. $f(x) = \dfrac{x^3 - 4.0x^2 - 4.0x + 16.0}{x^3 + 14.0x^2 + 63.0x + 90.0}$

E. None of the above are possible equations for the graph.

3. Which of the following functions *could* be the graph below?




A. $f(x) = \dfrac{x^3 + 3.0x^2 - 34.0x - 120.0}{x^3 + 5.0x^2 - 18.0x - 72.0}$

B. $f(x) = \dfrac{x^3 - 5.0x^2 - 36.0x + 180.0}{x^3 - 5.0x^2 - 18.0x + 72.0}$

C. $f(x) = \dfrac{x^3 + 6.0x^2 - 25.0x - 150.0}{x^3 - 5.0x^2 - 18.0x + 72.0}$

D. $f(x) = \dfrac{x^3 + 5.0x^2 - 36.0x - 180.0}{x^3 + 5.0x^2 - 18.0x - 72.0}$

E. None of the above are possible equations for the graph.

4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 7x^2 - 72x + 45}{12x^2 + 7x - 12}$$

A. Vertical Asymptote of $x = 1.0$ and hole at $x = 0.75$

B. Vertical Asymptote of $x = -1.333$ and hole at $x = 0.75$

C. Vertical Asymptotes of $x = -1.333$ and $x = 1.667$ with a hole at $x = 0.75$

D. Holes at $x = -1.333$ and $x = 0.75$ with no vertical asymptotes.

E. Vertical Asymptotes of $x = -1.333$ and $x = 0.75$ with no holes.

5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 - 1x^2 - 72x - 80}{4x^3 + 14x^2 - 31x + 60}$$

A. Vertical Asymptote of $y = 4$

B. Horizontal Asymptote of $y = 1.500$

C. Vertical Asymptote of $y = 1.500$

D. None of the above

E. Horizontal Asymptote of $y = 0$

---

6. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 79x^2 + 144x - 80}{12x^2 - 25x + 12}$$

A. Vertical Asymptote of $x = 1.0$ and hole at $x = 1.333$

B. Holes at $x = 0.75$ and $x = 1.333$ with no vertical asymptotes.

C. Vertical Asymptotes of $x = 0.75$ and $x = 1.333$ with no holes.

D. Vertical Asymptote of $x = 0.75$ and hole at $x = 1.333$

E. Vertical Asymptotes of $x = 0.75$ and $x = 1.25$ with a hole at $x = 1.333$

---

7. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 - 2x^2 - 43x + 30}{4x^2 - 23x + 15}$$

A. Horizontal Asymptote at $y = 5.0$

B. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x + 11$

C. Oblique Asymptote of $y = 2x + 11$.

D. Horizontal Asymptote of $y = 5.0$ and Oblique Asymptote of $y = 2x + 11$

E. Horizontal Asymptote of $y = 2.0$

---

8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 + 5x^2 - 21x + 10}{-9x^3 + 6x^2 + 4x - 4}$$

A. Vertical Asymptote of $y = 1$

B. Horizontal Asymptote of $y = 0$

C. Vertical Asymptote of $y = -0.667$

D. Horizontal Asymptote of $y = -0.667$

E. None of the above

---

9. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 13x^2 - 40x + 75}{12x^2 - 35x + 25}$$

A. Holes at $x = 1.25$ and $x = 1.667$ with no vertical asymptotes.

B. Vertical Asymptotes of $x = 1.25$ and $x = -2.5$ with a hole at $x = 1.667$

C. Vertical Asymptotes of $x = 1.25$ and $x = 1.667$ with no holes.

D. Vertical Asymptote of $x = 0.5$ and hole at $x = 1.667$

E. Vertical Asymptote of $x = 1.25$ and hole at $x = 1.667$

---

10. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 37x^2 - 59x - 60}{6x^2 + 5x - 25}$$

A. Vertical Asymptote of $x = -2.5$ and hole at $x = 1.667$

B. Vertical Asymptotes of $x = -2.5$ and $x = -0.75$ with a hole at $x = 1.667$

C. Vertical Asymptotes of $x = -2.5$ and $x = 1.667$ with no holes.

D. Holes at $x = -2.5$ and $x = 1.667$ with no vertical asymptotes.

E. Vertical Asymptote of $x = 2.0$ and hole at $x = 1.667$

---